LAND CAPABILITY CLASSIFICATION REPORT
JOHORE STATE

GOV. OF. MALAYSIA

TECHNICAL SUB-COMMITTEE
ON
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INTRODUCTION:

As part of a programme of land capability classification for West Malaysia, undertaken by the Technical Sub-Committee for Land Capability Classification of the N.D.P.C., a land capability classification study of the State of Johore was carried out during part of 1967 and 1968. This report summarises the results of this study, and includes a statistical summary prepared from various maps. In addition, reduced and simplified copies of the land alienation, mineral potentiality, soil suitability and forest productivity maps are attached to this report. Copies of the original maps, in addition to the ones attached to this report, on a scale of 1 inch to a mile are available in the office of the Natural Resources Section of the Economic Planning Unit. Additional information pertinent to this report can be obtained from reports published by the contributing Government Departments.

The main objective of this report is to provide an appraisal of the present land use pattern and the more important natural resources, and to obtain a planimetric measure of the extent of these resources. A very broad appreciation is also made of the possibilities for future natural resource use and land development, and to provide some of the data necessary for sound policy formulation. This report is not a detailed study, on the contrary, it is very broad in approach, consequently, it does not present a plan of development.

The data and maps presented in this report reflect the land use and natural resource utilization at the time of compilation. The compilation period extended from July 1967 towards the end of the year.

PRESENT LAND USE UTILIZATION:

The present land use pattern in Johore is presented in table 1 and map A attached to this report. The map which is on a scale of 4 miles to one inch (1:253,440), has been compiled by reduction from larger scale maps for each of the eight districts, and shows the boundaries of the more important alienation and gazettement groups within the State of Johore. The basic data was supplied by the State Survey Office and the respective district land offices. The map shows the location and extent of land alienated for agriculture, mining and urban development, and also of those areas which have been gazetted for forest, game, aborigine, malay, veterinary, or other official State or Federal use purposes. The remaining areas, indicated by blank spaces on the map, comprise the state land category.

This map, which reflects the legal situation and shows the boundaries of areas covered by deeds of title and gazettement notices, has been prepared for comparison with the mineral potentiality map, (Map B), the soil suitability map (Map C), and forest productivity (Map D). When making comparisons between these maps, by super imposing any of the resources maps (B,C, and D) on the land alienation map, it is important to note that map A does not necessarily reflect the present use to which the land is being put. For example, some of the land alienated for agriculture may never have been developed for this purpose and still lies idle, or it may have been developed and may since have been abandoned, while other areas, particularly state land, may be subject to illegal cultivation.

A more accurate picture of the present land use situation can be determined from a "Present Land Use Survey". Such a survey is presently being carried out with the aid of recent aerial photography for the States of West Malaysia. However, at the time of writing this report Johore State had not been covered.

The present summary presented on Map A and in tabular form in table 1 covers the mainland of Johore and Pulau Kupup, but not the islands off the east coast which form part of the Johore State territory. The total area of mainland Johore and the above named island, as determined by the summation method explained in Appendix 1, is approximately 4,692,690 acres, 7,332 square miles. Table 1 presents the estimated acreages of the land use categòries shown on the alienation and gazettement map.

It can be seen from table 1 that 43% of the total land area has been alienated for agriculture. The second largest category is that of forest reserves, which occupy 22% of the total, followed by state land, which occupies 20%. The above named 3 categories account for 85% of the total land area. The remaining 15% or 671,094 acres comprise game reserves, malay reserves and a few smaller categories as can be seen from the table. It is interesting to note that present mining leases do not occupy more than 36,225 acres or less than 1% of the total land area.

Mining:

The total area under mining lease is relatively small, at present 36,225 acres or .77% of the total land area is under mining lease. The districts of Kota Tinggi, Mersing and Segamat account for 92.57% of all land under mining leases.

Agriculture:

The land alienated for agriculture, comprising 2,027,565 acres, can be divided into two classes:

a. Small-holders agriculture
b. Estate agriculture

Small-holders agriculture has traditionally been associated with the coastal regions. Almost all of the agricultural alienated land on the West Coast, comprising the districts of Pontian, Batu Pahat and Muar have been alienated to small-holders. The most important commercial agricultural crops produced in this area are pineapple, rubber and coconuts.

Pineapples have been produced, processed and exported successfully during the past decade. Recently however, surplus crops produced by farmers and increased competition in the world market has decreased prices. This has not only resulted in lower returns to the individual producer but has retarded the rate of expansion of small-holders producing pineapple. Inter-cropping is practised by coconut small-holders, with vegetables and various types of fruits being grown underneath the coconut trees, augmenting the farmer's income in cash and kind. In recent years, the Government has made available capital for coconut replanting schemes and drainage projects. In areas where this has caused a substantial increase in coconut yields, this programme is justified. However, in view of the changed competitive position of the coconut industry, this program should be reappraised.

Further inland, in the district of Muar and the adjacent districts of Segamat, Kluang and Johore Bahru, the estate type agriculture is the more important. Commercial firms and F.L.D.A. have planted large areas under rubber and oil palm. However, with declining rubber prices, suitable old rubber land as well as additional suitable land is being planted under oil palm.

The land alienated for agriculture, in the districts of Mersing and Kota Tinggi on the East Coast, is mainly small-holders agriculture with some locally owned estates. Rubber is here the most important crop. Table 1 indicates that in the Mersing district the land alienated for agriculture accounts for only 2.02% of the total agricultural alienated land in the State, in the Kota Tinggi District this is 8.84%.

Forestry:

Forest reserves occupy 1,039,140 acres or 22.14% of the total land area in the State of Johore. In addition almost all the State land, accounting for 20.35% of the total land area, is under forest. Most of the state land has been logged or is under timber extraction licenses. The forest reserves are being managed on a sustained yield basis, areas that have been logged are being regenerated by the Forest Department. It can be seen from table 1 that the districts of Mersing, Kluang and Segamat account for 71.48% of all land gazetted as forest reserves. Some areas gazetted as forest reserves, have also been gazetted as game reserves, this however is not a conflict of interest, since the two are complementary. A forest reserve provides the animals a natural and undisturbed habitat.

Further perusal of table 1 will indicate to the reader not only the estimated acreage breakdown for the major land use categories on a State basis, but also for the individual districts.

NATURAL RESOURCES:

Mineral Resources:

Table 2 estimates the various areas of mineral potentiality categories, the same information is also shown on map B, which is a reduced copy of the maps contributed by the Geological Survey.

The mineral potentiality classification is based on the potential of any one area for mining.

Class I — Current Mining Land - Land covered by current mining leases.

Class II — Potential Mining Land - Land shown by prospecting results or inferred from geological records to contain more than 0.2 kati of cassiterite per cubic yard, or workable surface deposits of other minerals, e.g. iron-ore.

Class III — Possible Mining Land - Land for which present evidence indicates a possible mineral potential but which needs to be thoroughly examined before commercial development can take place; or unprospected areas which on geological evidence might contain a mineral potential; or unknown areas.

Class IV Non-Mining Land - Land which has been prospected and shown to have no mineral potential, or which on geological evidence is unlikely to have any mineral potential.

The above classification has been modified after the data had been processed, reprocessing of the data would have caused a lengthy delay in finalising this report. However, these modifications were incorporated in the production of the mineral potentiality map (map B). As a result the legend on map B differs from the mineral potentiality categories used in table 2.

The modified classification, corresponding with the legend of the mineral potentiality map (map B), is represented below, the brackets behind the individual classes refer to the original classification.

Class I Probable mining land as deduced from prospecting results and geological evidence (2).

Class II Area under mining lease/certificate or an area in which active mining is taking place (1).

Class III Possible mining land as deduced from geological evidence (3).

Class IV Areas which on geological evidence might contain mineral deposits (3).

Class V Areas for which no geological or other information is available (3).

Class VI Non-mining land (4).

In comparing the two classification one will notice that the only modifications are a reversing of the classes 1 and 2, class 1 of the old classification becomes class 2 of the new one, and vice versa, and a more detailed breakdown of class III of the old classification into 3 classes, class 3, 4 and 5 of the modified classification. In comparing class 3 of the old classification with the modified one, it is estimated that not more than 15% of the possible mining category, comprises the modified category 3. The above changes in the classification were made because it was felt that potential mining land deserves a higher priority than present mining land, as it represents an untapped future resource, while on present mining land the resources are already being exploited. In addition, class 3 was divided into 3 classes after it was found that it was possible to delineate the three classes on the map.

As a result of the slight modifications in the classification caution should be used in interpreting the table and map together. It can be seen from table 2 that 19,251 acres or 59.23% of the area under mining lease is in the district of Kota Tinggi and that this district also possesses 48.95% of the potential mining area. Mersing district has the second largest area for potential mining accounting for 36.36%. The district of Muar accounts for the third largest percentage of land under mining lease and area for potential mining. Class 3 represents 1,955,943 acres or 41.68% of the total land area, however it is estimated that only 15% or 293,391 acres is possible mining land as deduced from geological evidence.

At the present time mining is taking place in the Kota Tinggi district in two areas, a) the southern tip of the Pengerang peninsula and b) west and north west of the road from Kota Tinggi to Lombong.

The present mining operations in the southern part of the Pengerang peninsula concentrate almost exclusively on bauxite, which is almost all exported as ore. The present mining concerns have not exhausted all their reserves, in fact there are significant ore reserves left. The remainder of the area, classified on the map as class 4, has geological features that suggest that mineral occurrences might be found. In order to determine whether or not they represent an economic potential, it is suggested that a broad reconnaissance mineral exploration program be undertaken.

The current alluvial mining in the area west and north west of the Kota Tinggi - Lombong road is all tin, extracted almost entirely by gravel pump method. This area contributed the greater part of the total tin production for the State of Johore in 1965. Present information indicates that additional areas in this region have mineral potentials. These areas warrant not only further investigations for alluvial tin deposits but also for bed-rock tin and sulphite.

In the Mersing district, tin is being mined by gravel pump method in a belt along the Kota Tinggi-Mersing Road. Present information indicates that additional tin deposits are available when the present leases are worked out. The areas delineated as class 4 on the map warrant broad mineral investigations, especially the area around Jemaluang warrants bedrock exploration for tin, wolfram and base metals, in addition to prospecting ror alluvial tin deposits.

An area between Batu Pahat, Labis and Muar contains almost all the iron deposits in the State. At present the area is being mined for iron in several localities, as indicated on map B. The total production for the area has decreased drastically since 1965, during that year the output was in excess of 1 million tons. This drop in production can be mainly attributed to marketing problems and to the effect of tribute. The total output is produced by a number of small mines, each having a low tonnage output with an inherent high cost of transportation.

At present little or no information is available on the additional mineral potential of the area, however further investigations for iron in the area is warranted, there are also known occurrences of manganese and bauxite. In the district of Muar near Dinding along the road from Muar to Yong Peng deposits of tin and niobium tantalum are being mined.

Under the present mining regulations, the maximum area granted for a prospecting permit is not nearly sufficient to encourage high cost bedrock exploration. In order to increase prospecting, especially that of bedrock exploration, it is strongly suggested that the existing regulations are revised to ensure more effective local participation by large mining concerns.

<u>Soil Resource:</u>

Table 3 estimates the various land areas of soil suitability categories, the same information is also shown on map C, which is a reduced copy of the maps contributed by the Department of Agriculture.

The soil suitability classification is based on features of the soil which limits the suitability of the soil for agriculture. Information was obtained from observations made by soil surveyors combined in some cases with information concerning the performance of main crops on different soils. The classification is broad in approach because it is based on data obtained from the schematic-reconnaissance survey of Malaya. Moreover, it is primarily aimed at assessing suitabilities for the main economic crops in the country, and does not contain enough detailed information to predict accurately the suitability for crop not grown on an economic basis in Malaysia.

The limitations to the suitability of soils for agricultural development are divided into three groups*:

a) very serious limitations e.g. slopes steeper than 20°

b) serious limitations e.g. moderate steep slopes $12^{\circ} - 20^{\circ}$

c) minor limitations e.g. susceptible to flooding.
Based on this, five classes have been established.

Class I	Soils with no limitations to agricultural development.
Class II	Soils with few minor limitations to agricultural development.
Class III	Soils with at least one serious limitation to agricultural development.
Class IV	Soils with more than one serious limitation to agricultural development.
Class V	Soils with at least one very serious limitation to agricultural development.

It can be noted from table 3, that the total acreage of class 1 and 2 is 1,493,505 acres or 31.82% of the total land area. Past experience has indicated that the classes 1 and 2 are eminently suitable for a wide variety of crops. In many cases those crops can also be produced on class 3 soils, especially those that have been downgraded due to terrain conditions. It may be concluded from the above that areas where crop diversification is most likely to succeed, are confined almost entirely to the areas covered by soil suitability classes 1 and 2. According to present information areas covered by classes 4 and 5 are not generally considered suitable for agricultural development.

It is interesting to note that no areas in the district of Pontian have been mapped as class 1 or 2, this can be attributed to the large areas of poorly drained organic soils in the form of peat and muck. These soils mapped as class 3 have been drained and are now being used for extensive pineapple cultivation. The districts of Batu Pahat and Muar have a total of 272,826 acres mapped as class 1 and 2 soils. The flat coastal areas, mapped as class 1 and 2, consist of marine clays on which coconuts are produced. The soils of the areas farther inland belong to the Rengam series and produce mainly rubber.

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* Ministry of Agriculture and Co-operatives Malaysia, Division of Agriculture Bulletin No. 119, Soil Survey Manual for Malay Conditions PP 191-193.

The districts of Segamat and Kluang have a complex soils pattern, the soils derived from igneous rocks, including the Segamat and Rengam soil series, are predominantly mapped as class 1 and 2 and to some extent as class 3 which is due to topography. The greater part of the soils mapped as class 3 in the districts of Segamat and Kluang are derived from sedimentary materials mainly shales and sand-stones. The total area of class 1 and 2 mapped in the above two districts is 492,039 acres.

The soils in the district of Johore Bahru are mainly derived from igneous rocks. In addition, a substantial area has soils derived from older alluvium which have been mapped as class 3. However, from recent more detailed investigations these soils appear better than originally thought and suitable for diversification in agricultural crops.

The soils in the districts of Kota Tinggi and Mersing mapped as class 1 and 2 are mainly derived from igneous materials, however some of these soils with the same parent material were down-graded due topography. The area mapped as class 3 in the districts of Mersing and Kota Tinggi are sub-recent alluvium or derived from sedimentary materials.

Knowing that class 1 and 2 are eminently suited for agricultural development with crop diversification, and class 3 suitable for agricultural development for more tolerant tree crops, 3,072,708 acres or 65.47% of the total land area of the State could be used for this purpose. However, at present, of the total area mapped as class 1, 2 and 3 1,491,849 acres have already been alienated for agricultural purposes. Further perusal of table 3 and map C will indicate to the reader the extent and location of the individual soil classes.

Forest Resources:

Table 4 estimates the various areas of forest productivity categories, the same information is also shown on map D, which is a reduced copy of the forest productivity maps contributed by the Forest Department. The forest productivity classification is based on the productivity of the commercial timber. Included as commercial species are those included in classes A to C of the Forest Department's Linear Sampling (L.S.) list of species, A system of 4 classes has been used to indicate the productivity of the commercial species in tons of round timber per acre. The legend on map D differs slightly from the 4 class system used in table 4. On this map an extra class has been introduced i.e. IV R or T, covering all areas that have been treated or regenerated by the Forest Department after a timber extraction license in an area had expired. As a result, the old class IV on map D has become class V. In table 4, however, this change was not possible since all data had already been processed, reprocessing the data would have caused a lengthy delay in publishing the report. As a result class IV in table 4 represents class V and class IV R or T on map D. However, it can be seen from map D that all treated or regenerated forests (class IV R or T) are located in forest reserves, which is a result of the Forest Department's policy to treat only the cut over areas in forest reserves. The five classes used are:-

Class I — Highly productive forest with a basal area of commercial species of at least 50 square feet, or an approximate equipvalence of at least 25 tons of round timber per acre.

Class II	Productive forest with a basal area of commercial species between 35 and 50 square feet, or an approximate equivalence of 15 to 25 tons of round timber per acre.
Class III	Marginal forest with a basal area of commercial species between 20 and 35 square feet, or an approximate equivalence of 10 to 15 tons of round timber per acre.
Class IV R or T	Regenerated or treated forest.
Class V	Unproductive forest with a basal area of commercial species below 20 square feet or an approximate equivalence of less then 10 tons of round timber per acre.

Table 1, estimating areas alienated for different purposes, indicated that 1,039,140 acres have been gazetted as forest reserves, accounting for 22.14% of the total land area in the State. In addition one may assume that almost all the state land accounting for 954,891 acres or 20.35% of the total land area is under forest. It can be seen from the above acreage figures that 42.49% of the total land area is still under forest, or has recently been cut and is being regenerated.

Timber is extracted on a commercial basis from forest reserves and state land, at the present time 241,548 acres are under timber extraction licenses. The latest available preliminary figures for the areas that were logged in any one year are for the year 1965. During that period 11,523 acres were logged over in forest reserves and 69,255 acres on state land. As mentioned above, silvicultural methods are used to restock the timber in forest reserves. On state lands however, no silvicultural methods are used.

The forested areas in the State of Johore, including both state land and forest reserves, can be divided into two categories.

a. forests below the steep land boundary
b. forests above the steep land boundary

The northern part of the State, adjacent to the Pahang and Negeri Sembilan border, is covered with forest reaching as far south as the Segamat-Kluang-Mersing Road. The greater part of this area, especially the most northern part, has a steep topography. Other forests above the steep land boundary can be found in the hilly parts of the districts of Kota Tinggi and Kluang and the small hill ranges in the Mersing district. Forests below the steep land boundary are found on the fringes of these areas. In addition, one can find small mangrove forest areas along the coasts, especially along the coasts in the southern part of the State. These mangrove forest areas are an important source of fuel wood and poles.

Table 4 indicates the estimated areas of forest productivity for the State, the location of these areas can be seen from map D. The total area of highly productive and productive timber accounts for 690,138 acres or 14.71% of the total land area in the State. Of these two categories two third is located in the districts of Mersing, Kluang and Segamat. Class 4 accounts for 3,597,566 acres or 75.59% of the total land area. This high percentage is not surprising since it not only includes the treated or regenerated forests, as pointed out above, but also all areas alienated for other purposes than forestry.

Water Resource:

Other natural resource classification categories having an important bearing on land use are those concerned with water. Maps showing the boundaries of catchments presently being utilized for purposes of potable, industrial, hydro-electric, or irrigation purposes have been prepared by the responsible authorities. (Public Works Department, National Electricity Board and Department of Irrigation and Drainage). Table 5, indicates the areas presently utilised as water catchments by the above mentioned departments. Similarly, table 6 gives the estimated areas presently being utilized for irrigation and drainage schemes. It can be seen from this table that all drainage schemes are located in the districts of Pontian, Batu Pahat and Muar. Almost all these schemes are part of the rehabilitation scheme for coconut producers.

Also relevant to an understanding of the use of the water resources in the State is a picture of the annual rainfall distribution pattern and its relationship to the topography. Table 7 prepared from isohytes, estimates areas of land subject to different annual rainfall intensities. It can be seen from the table that no area receives less than 70" of rainfall, in fact not more than 1,274,499 acres or 27.16% of the total land area receives an annual rainfall of less than 90". Further perusal of table 7 will indicate to the reader the distribution on a district basis. Table 8 estimates the areas between the different contours, 4,388,400 acres or 93.52% of the total land area lies below the 500 foot contour level.

LAND CAPABILITY:

Table 9 presents the estimated areas of land Capability Categories in acres. The five categories in the table have been compiled from the mineral potentiality, soil suitability and forest productivity data.

Class I	Land possessing a high potential for possible mineral development. (The estimated acreage figure for this class has been taken as the aggregate acreages for current and potential mining, classes 1 and 2 of the mineral potentiality classification).
Class II	Land possessing a high potential for possible agricultural development with a wide range of crops. (The acreage figure for this class has been taken as the aggregate acreages of the soil suitability categories having no or a few minor limitations to agricultural development, class 1 and 2 of the soil suitability classification, less those areas over-lapped by class I above).

Class III Land possessing a moderate potential for possible agricultural development, because of a restricted range of crops. (The acreage figure for this class is the same as class 3 of the soil suitability classification, less those areas over-lapped by class I above).

Class IV Land possessing a high potential for possible productive forest development. (The acreage figure for this class has been taken as the aggregate acreages of class 1, 2 and 3 of the forest productivity classification, less those areas over-lapped by classes I, II and III above.)

Class V Land possessing little or no mineral, agricultural or productive forest potential, but suitable for possible alternative development such as: protective forest reserves, water catchment areas, game reserves, national parks, etc. (The acreage for this class has been taken as the acreage for the unproductive forest class, class 4 of the forest productivity classification, less those areas over-lapped by classes I, II or III above.)

The same information presented in table 9 can be obtained from the mineral potentiality map, the soil suitability map, and forest productivity map, maps B, C and D attached to this report by super imposing any one of the above maps on each other. Areas of conflicts, e.g. between mineral potential and agricultural potential land will be included in class I of the land capability classification etc.

It should be clearly understood that in producing the land capability classification, certain basic assumptions had to be made. At present not enough basic information is available to introduce a priority to any one resource development. In areas of conflict further studies should be undertaken to evaluate the alternative uses of the land. However, at this stage it was felt that it would be more useful to introduce a ranking of the resources that would provide the State with a preliminary guidelines for land allocation, than nothing at all. Moreover, it can be said that the priority introduced in the land capability classification taken in a broad sense, will probably be proven right when more information becomes available at a later stage. It has further been assumed that there will be a continuing demand for additional mining land, which will be met largely from the potential mining class shown on map B and table 2. Also that there will be a continuing need to develop more land for agriculture, with this need being met largely from the unalienated areas shown to have either no, few, or only one serious limitation to agricultural development, shown on map B and table 3. Similarly, the eventual concentration of the forest industry in those areas containing productive forest and not suitable for mining or agriculture is assumed.

The broad application of the classification criteria to West Malaysia as a whole, has already indicated that the area of land subject to mining is likely to increase only by a relatively small amount. The extent of the increase will be one of probably less than 2% of the total area of West Malaysia. However, the land developed to agriculture might be increased to almost double the existing figure, and might eventually extend over at least 55% of the country. Even if this agricultural development is allowed for, it is believed that some 32% of the total area of the country will still consist of productive forest. This will constitute the permanent productive forest estates in the future. Another 10% of the country will most likely fall into the permanent productive category and is likely to be conserved in its natural condition for water-shed protection, nature conservation or similar purpose.

The estimated areas of land in the State of Johore falling within the five land capability classes is apparent from table 9. It can be seen that of the total land area of the State only 62,100 acres or 1.33% has a mining potential. Land suitable for agriculture accounts for 64.50% of the total land area. The remainder of the land area falls into classes 4 and 5.

RESOURCE DEVELOPMENT POTENTIAL:

A comparison of the land capability classification table with table 1 showing the land areas that have been alienated, suggests the extent of the opportunities for further land development in the State.

At present 2,027,565 acres have been alienated for agriculture, of this area, 1,491,849 acres or 73% possess soils which are suitable for agriculture, class 1, 2 and 3 of the soil suitability classification. The remainder of the agricultural alienated lands, amounting to 535,716 acres have soils which are not recommended for agriculture. These areas can be located by superimposing the soil suitability map (Map C) on the land alienation map (Map A). However, in addition to the areas already alienated for agriculture, 1,045,143 acres of the land area of the State possess an agricultural potential.

Table 10, indicates the estimated areas of alienated and stateland having soils suitable for agricultural development. It can be seen that 607,959 acres of state land have an agricultural potential. Most of this land can be found in the district of Kota Tinggi, 310,914 acres or 51.14%. The Pengerang Peninsula and the central area of the district offer this potential for agricultural development. The other two districts with the largest acreages of stateland suitable for agricultural development are Mersing and Kluang. However, the largest part of the state land in the district of Kluang has been committed to F.L.D.A.

It can also be seen from table 10 that, besides the state land, the forest reserves offer the greatest potential for agricultural development. A total of 555,795 acres in the forest reserves out of total of 1,039,140 acres gazetted as forest resdrves possess soils suitable for agricultural development. The forest reserves in the districts of Mersing, Kluang and Segamat alone possess a total of 455,814 acres of suitable soils for agricultural development. Further perusal of table 10, will indicate to the reader the extent and distribution of soils suitable for agricultural development on state land and areas already alienated.

In comparing table 10 and table 9, one will notice a difference in acreage between the total of the soil suitability classes 1, 2 and 3 and class 2 and 3 from table 9. This difference, being 45,747 acres is the area where there exists a conflict between mining and agricultural development. By superimposing the mineral potentiality map (Map B) on the soil suitability map (Map C) these areas can be located. The total acreage suitable for agricultural development and having a mining potential represents only 1.48% of the total land area having soils suitable for crop production.

Table 11, presents the estimated areas of soil suitability class 1, 2 and 3 subject to different annual rainfall intensities.

It may be concluded that the greatest potential for agricultural expansion is on state land and in forest reserves. Future mining development will not interfere, since the area where there exists a conflict is very small. In order to ensure that agricultural development will be carried out in an orderly fashion, active liaison should be established between the various government departments and land development authorities. It is of utmost importance that the Forest Department is well informed of future agricultural development schemes to ensure that all commercial timber has been cut, and if development takes place within the boundaries of a forest reserve no silvicultural methods are used to regenerate the timber. In order to minimize conflicts of this nature, it is recommended that the State Government focus its attention in the first place on stateland before degazetting forest reserves for land development.

Table 12 indicates the estimated areas of state land and alienated land covered by productive forest. The total estimated area covered by forest productivity classes 1, 2 and 3 is 1,144,917 acres. As expected, the greatest percentage of this acreage is located in forest reserves, game reserves and on state land. These three areas account for 1,082,610 acres.

In order to determine the areas that are suitable for agricultural development and are also covered by productive forest, one should compare tables 4 and 9. The same information can also be obtained by superimposing the forest productivity map (Map D) on the soil suitability map (Map C). One will find that 602,577 acres of the land area of the State covered by productive forest have soils which are suitable for agricultural development. As expected the greater part of this acreage is located in forest reserves.

In contrast to the conflict that exist between forestry and agriculture, mining development does not present a problem of the same magnitude. In fact the conflict is very small, as has already been indicated above. Table 13, indicates the estimated areas of state land and alienated land covered by mineral potentiality categories.

Johore State has 364,734 acres of land gazetted as game reserves, most of these reserves are part of areas that have also been gazetted as forest reserves, except for the Segamat Sanctuary and 15% of the Endau-Kluang Reserve. As indicated, large acres of these reserves have soil suitable for agricultural development, as a result it is most likely that these areas will be developed for agricultural purposes.

However, this exercise has indicated that there are areas within the presently gazetted game reserves that not only have topography which makes it not suitable for agriculture but also soils which are of an inferior quality. Two of these areas can be located: a) the Mersing game reserve, which is part of the Mersing forest reserve and b) that part of the Endau-Kluang reserve that falls outside the forest reserve.

In preserving the above areas as game reserves, they may well function as areas where wild life will be attracted to as adjacent areas are being developed. Moreover, the coastal strip of the Mersing game reserves has a potential for recreation.

SUMMARY:

This report presents a description of the physical resources of the State, an evaluation of the manner in which these resources are being allocated and used, and through the land capability classification a provisional guideline concerning their future allocation and use.

The broad pattern of future development is dictated by terrain, climatic, and hydrological conditions and by the present alienated and gazettement pattern. It is apparent that two main programmes will be required. The first applies to the areas already alienated for agriculture. Development efforts in this areas should be directed towards raising crop yields and ensuring the stability of yield. The second type of programme involves large-scale establishment of permanent cultivation in those areas that have suitable soils for agricultural production.

This study has indicated that large areas of land, which are presently not committed, have good potentials for agricultural development. Prospects for development of forestry in the State are good, but should be concentrated in areas not suitable for long range agricultural development. Mining prospects should be fully explored, in the form of bedrock exploration besides the search for alluvial tin, in areas delineated having a mineral potential.

APPENDIX 1

Area Summation Method:

The area estimates presented in this report and its accompanying tables were prepared by mechanical data processing methods, using I.C.T. punch cards. The land use, natural resource and other land quality data on the contributed maps have been coded on a point basis using a linear sampling method; based on the intersection points of the 1,000 yard grid squares, which are shown on all 1:63,360 published topographic maps of West Malaysia.

The percentage standard error for individual acreage estimates can be determined from the following table.

Table 1

	N			
	50,000	10,000	5,000	1,000
C.V.(%)	NK	NK	NK	NK
100	1	1	1	1
30	11	11	11	11
25	16	16	16	16
20	25	25	25	24
15	45	44	44	43
10	100	99	98	91
5	400	380	370	286
4	620	590	560	385
3	1090	1000	910	526
2	2380	2000	1670	714
1	8330	5000	3340	909
0.5	22220	8000	4440	976

N = Total no. of sampling points in the area. The exact plain acreage equivalent of a 1,000 yard square is 20,661,116 acres, but in order to facilitate the calculations necessary for preparing the acreage tables presented in this report, the area equivalent of each sampling point has been taken as 207 acres, thus introducing a bias of .2% into the quoted figures. Therefore, in order to determine the number of sampling points related to a given acreage, the acreage figure should be divided by 207.

NK = Total no. of sampling points with a particular quality "K".

The table gives, for four area classifications, the number of points with a particular quality, necessary to give the corresponding coefficient of variation; e.g. the total estimated land area of the State of Johore is 4,692,690 acres which is equivalent to 22,670 sampling points. The percentage standard error for area estimates within the boundary of the State can therefore be calculated by reference to column 3 in the table. As the total estimated area of the district of Kota Tinggi is 849,321 acres (table 1) equivalent to 4,103 sample points, and as this figure is most closely approximate to the figure of 5000 in the third column of the table, the standard error for the estimated acreage in this district is 1%.

The standard error $= \frac{1}{100} \times 4103 \times 207 = \underline{\underline{8493}}$ acres.

TABLE 7

STATE OF JOHORE

ESTIMATED AREAS OF LAND SUBJECT TO DIFFERENT ANNUAL RAINFALL INTENSITIES IN ACRES

DISTRICT	Class 0 70"	Class 1 70-80"	% of State Total	Class 2 80-90"	% of State Total	Class 3 90-100"	% of State Total	Class 4 100-110"	% of State Total	Class 5 110-120"	% of State Total	Class 6 120-130"	% of State Total	Class 7 130-140"	% of State Total	Class 8 140-150"	% of State Total	Class 9 150"	TOTAL	% of State Total
Mersing	-	-	-	28,152	3.59	71,622	6.15	55,062	6.87	167,256	25.23	312,570	43.23	44,298	99.53	21,735	100.00	-	700,695	14.93
Kota Tinggi	-	-	-	-	-	11,178	0.97	86,940	10.84	365,769	55.17	385,434	53.31	-	-	-	-	-	849,321	18.10
Johore Bharu	-	-	-	-	-	133,308	11.45	184,230	22.97	83,628	12.61	25,047	3.46	-	-	-	-	-	426,213	9.08
Pontian	-	-	-	-	-	25,047	2.15	170,568	21.27	31,464	4.75	-	-	-	-	-	-	-	227,079	4.84
Batu Pahat	-	-	-	57,339	7.31	275,310	23.65	154,836	19.31	-	-	-	-	-	-	-	-	-	487,485	10.39
Muar	-	76,797	15.67	221,697	28.26	196,236	16.86	90,459	11.28	-	-	-	-	-	-	-	-	-	585,189	12.47
Kluang	-	-	-	202,446	25.80	431,388	37.06	59,823	7.46	14,904	2.24	-	-	-	-	-	-	-	700,561	15.10
Segamat	-	413,172	84.33	274,896	35.04	19,872	1.71	-	-	-	-	-	-	207	.47	-	-	-	708,147	15.09
STATE TOTAL:	-	489,969	100.00	784,530	100.00	1,163,961	100.00	801,918	100.00	663,021	100.00	723,051	100.00	44,505	100.00	21,735	100.00	-	4,692,690	100.00
STATE TOTAL:	-	489,969 (10.44%)		784,530 (16.72%)		1,163,961 (24.80%)		801,918 (17.09%)		663,021 (14.13%)		723,051 (15.41%)		44,505 (0.95%)		21,735 (0.46%)			4,692,690 (100.00%)	

TABLE 8

STATE OF JOHORE

ESTIMATED AREAS OF LAND BETWEEN DIFFERENT CONTOUR LAYERS IN ACRES

DISTRICT	Class 0 0-499'	% of State Total	Class 1 500-999'	% of State Total	Class 2 1000-1999'	% of State Total	Class 3 2000-2999'	% of State Total	Class 4 3000-3999'	% of State Total	Class 5 4000-4999'	% of State Total	Class 6 5000-5999'	% of State Total	Class 7 6000-6999'	% of State Total	Class 8 7000-7999'	% of State Total	TOTAL	% of State Total
Mersing	641,286	14.61	34,983	22.50	22,563	17.78	1,863	9.57	-	-	-	-	-	-	-	-	-	-	700,695	14.93
Kota Tinggi	807,507	18.40	31,878	20.51	9,729	7.67	207	1.06	-	-	-	-	-	-	-	-	-	-	849,321	18.10
Johore Bharu	418,140	9.53	4,968	3.19	3,105	2.45	-	-	-	-	-	-	-	-	-	-	-	-	426,213	9.08
Pontian	227,079	5.17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	227,079	4.84
Batu Pahat	482,103	10.99	4,554	2.93	828	0.65	-	-	-	-	-	-	-	-	-	-	-	-	487,485	10.39
Muar	549,378	12.52	18,216	11.72	12,420	9.79	4,347	22.34	828	80.00	-	-	-	-	-	-	-	-	585,189	12.47
Kluang	678,753	15.47	19,044	12.25	10,143	7.99	621	3.20	-	-	-	-	-	-	-	-	-	-	708,561	15.10
Segamat	586,154	13.31	41,814	26.90	68,103	53.67	12,420	63.83	207	20.00	-	-	-	-	1,449	100.00	-	-	700,147	15.09
STATE TOTAL:	4,388,400	100.00	155,457	100.00	126,891	100.00	19,458	100.00	1,035	100.00	-	-	-	-	1,449	100.00	-	-	4,692,690	100.00
STATE TOTAL:	4,388,400 (93.52%)		155,457 (3.31%)		126,891 (2.70%)		19,458 (0.42%)		1,035 (0.02%)		-	-	-	-	1,449 (0.03%)		-	-	4,692,690 (100.00%)	

TABLE 9

STATE OF JOHORE

ESTIMATED AREAS OF LAND CAPABILITY CATEGORIES IN ACRES

DISTRICT	Class 1		Class 2		Class 3		Class 4		Class 5			
	Potential Mining	% of State Total	Potential Agriculture*1	% of State Total	Potential Agriculture *2	% of State Total	Potential Forestry	% of State Total	Potential Protectives Forestry	% of State Total	Total	% of State Total
Mersing	16,974	27.34	141,795	9.61	287,730	18.54	99,153	18.27	155,043	14.61	700,695	14.93
Kota Tinggi	33,741	54.33	401,373	27.21	175,122	11.28	106,398	19.61	132,687	12.50	849,321	18.10
Johor Bharu	207	0.33	170,982	11.59	180,504	11.63	28,359	5.23	46,161	4.35	426,213	9.08
Pontian	-	-	-	-	81,972	5.29	33,741	6.22	111,366	10.50	227,079	4.84
Batu Pahat	1,656	2.67	47,610	3.23	189,819	12.23	14,697	2.71	233,703	22.02	487,485	10.39
Muar	8,487	13.67	221,283	15.00	139,311	8.98	59,202	10.91	156,906	14.79	585,189	12.47
Kluang	828	1.33	320,643	21.74	206,586	13.31	59,823	11.03	120,681	11.38	708,561	15.10
Segamat	207	0.33	171,396	11.62	290,835	18.74	141,174	26.02	104,535	8.85	708,147	15.09
STATE TOTAL:	62,100	100.00	1,475,082	100.00	1,551,879	100.00	542,547	100.00	1,061,082	100.00	4,692,690	100.00
STATE TOTAL:	62,100 (1.33%)		1,475,082 (31.43%)		1,551,879 (33.07%)		542,547 (11.56%)		1,061,082 (22.61%)		4,692,690 (100.00%)	

*1 Land possessing a high potential for possible agricultural development with a wide range of crops.

*2 Land possessing a moderate potential for possible agricultural development with a restricted range of crops.

TABLE 10

STATE OF JOHORE

ESTIMATED AREAS OF ALIENATED AND STATE LAND COVERED BY SOIL SUITABILITY CATEGORIES IN ACRES

DISTRICT	SOIL SUITABILITY	Class 0 State Land	% of State Total	Class 1 Alienated Agriculture	% of State Total	Class 2 Mining Lease	% of State Total	Class 3 Malay Reserve	% of State Total	Class 4 Grazing Reserve	% of State Total	Class 5 Aborigine Reserve	% of State	Class 6 Forest Reserve	% of State Total	Class 7 Game Reserve	% of State Total	Class 8 Town Land Govt. Reserve	% of State Total	TOTAL	% of State Total
ersing	Class 1	-		-		-		-		-		-		-		10,557		-		10,557	
	2	27,730		1,035		2,070		-		-		621		58,995		44,091		-		134,550	
	3	86,940		21,735		4,968		6,831		414		207		107,847		68,724		-		297,666	
	Total:	114,678	18.86	22,770	1.53	7,038	28.10	6,831	6.04	414	6.45	828	18.18	166,842	30.02	123,372	51.69	-	-	442,773	14.41
a Tinggi	Class 1.	31,257		49,680		2,898		828		-		-		11,178		6,003		207		102,051	
	2.	183,609		51,129		3,519		19,251		-		2,070		18,630		32,292		-		310,500	
	3.	96,048		54,855		5,175		15,525		-		207		11,178		4,554		828		188,370	
	Total:	310,914	51,14	155,664	10.43	11,592	46.28	35,604	31.50	-		2,277	50.00	40,986	7.37	42,849	17.95	1,035	3.52	600,921	19.56
re Bharu	Class 1.	828		119,025		-		828		-		-		6,831		-		2,070		129,582	
	2.	207		38,709		-		-		-		-		1,863		-		621		41,400	
	3.	16,048		153,801		-		621		-		207		2,691		-		7,038		180,711	
	Total:	17,388	2.86	311,535	20.89	-		1,449	1.29	-		207	4.55	11,385	2.05	-		9,729	33.10	351,693	11.44
tian	1.	-		-		-		-		-		-		-		-		-		-	
	2.	-		-		-		-		-		-		-		-		-		-	
	3.	3,105		74,313		-		3,312		-		-		207		-		1,035		81,972	
	Total:	3,105	0.51	74,313	4.98	-		3,312	2.93	-		-		207	0.04	-		1,035	3.52	81,972	2.67
u Pahat	1.	2,691		18,009		-		-		-		-		1,656		-		414		22,770	
	2.	3,105		20,493		-		1,242		-		-		-		-		-		24,840	
	3.	35,397		144,900		414		828		414		-		4,347		-		4,761		191,061	
	Total:	41,193	6.78	183,402	12.29	414	1.65	2,070	1.83	414	6.45	-		6,003	1.08	-		5,175	17.61	238,671	7.77
ar	1.	5,796		103,914		-		621		414		-		12,213		-		2,484		125,442	
	2.	3,726		85,698		-		5,589		1,863		414		-		-		2,484		99,774	
	3.	7,038		96,255		207		7,038		414		-		29,187		-		1,035		141,174	
	Total:	16,560	2.72	285,867	19.16	207	0.83	13,248	11.72	2,691	41.94	414	9.09	41,400	7.45	-		6,003	20.42	366,390	11.92
luang	1.	12,420		44,505		-		-		-		-		828		3,726		621		62,100	
	2.	24,012		108,054		-		828		-		621		117,576		5,589		1,863		258,543	
	3.	41,814		89,838		828		8,073		621		207		60,444		5,382		207		207,414	
	Total:	78,246	12.87	242,397	16.25	828	3.31	8,901	7.88	621	9.68	828	18.18	178,848	32.18	14,697	6.16	2,691	9.15	528,057	17.19
egamat	1.	4,761		58,374		2,070		2,277		-		-		41,607		11,799		621		121,509	
	2.	1,035		11,799		-		20,079		621		-		11,799		4,554		-		49,887	
	3.	20,079		145,728		2,898		19,251		1,656		-		56,718		41,400		3,105		290,835	
	Total:	25,875	4.26	215,901	14.47	4,968	19.83	41,607	36.81	2,277	35.48	-		110,124	19.81	57,753	24.20	3,726	12.68	462,231	15.04
STATE TOTAL:		607,959	100.00	1,491,849	100.00	25,047	100.00	113,022	100.00	6,417	100.00	4,554	100.00	555,795	100.00	238,671	100.00	29,394	100.00	3,072,708	100.00
STATE TOTAL:		607,959 (19.78%)		1,491,849 (48.54%)		25,047 (0.82%)		113,022 (3.68%)		6,417 (0.21%)		4,554 (0.15%)		555,795 (18.09%)		238,671 (7.77%)		29,394 (0.96%)		3,072,708 (100.00)	

TABLE 10

STATE OF JOHORE

ESTIMATED AREAS OF ALIENATED AND STATE LAND COVERED BY SOIL SUITABILITY CATEGORIES IN ACRES

RICT	SOIL SUITABILITY	Class 0 State Land	% of State Total	Class 1 Alienated Agriculture	% of State Total	Class 2 Mining Lease	% of State Total	Class 3 Malay Reserve	% of State Total
ing	Class 1	-		-		-		-	
	2	27,730		1,035		2,070		-	
	3	86,940		21,735		4,968		6,831	
	Total:	114,678	18.86	22,770	1.53	7,038	28.10	6,831	6.04
Tinggi	Class 1.	31,257		49,680		2,898		828	
	2.	183,609		51,129		3,519		19,251	
	3.	96,048		54,855		5,175		15,525	
	Total:	310,914	51,14	155,664	10.43	11,592	46.28	35,604	31.50
Bharu	Class 1.	828		119,025		-		828	
	2.	207		38,709		-		-	
	3.	16,048		153,801		-		621	
	Total:	17,388	2.86	311,535	20.89	-		1,449	1.29
an	1.	-		-		-		-	
	2.	-		-		-		-	
	3.	3,105		74,313		-		3,312	
	Total:	3,105	0.51	74,313	4.98	-		3,312	2.93
Pahat	1.	2,691		18,009		-		-	
	2.	3,105		20,493		-		1,242	
	3.	35,397		144,900		414		828	
	Total:	41,193	6.78	183,402	12.29	414	1.65	2,070	1.83
r	1.	5,796		103,914		-		621	
	2.	3,726		85,698		-		5,589	
	3.	7,038		96,255		207		7,038	
	Total:	16,560	2.72	285,867	19.16	207	0.83	13,248	11.72
uang	1.	12,420		44,505		-		-	
	2.	24,012		108,054		-		828	
	3.	41,814		89,838		828		8,073	
	Total:	78,246	12.87	242,397	16.25	828	3.31	8,901	7.88
amat	1.	4,761		58,374		2,070		2,277	
	2.	1,035		11,799		-		20,079	
	3.	20,079		145,728		2,898		19,251	
	Total:	25,875	4.26	215,901	14.47	4,968	19.83	41,607	36.81
STATE TOTAL:		607,959	100.00	1,491,849	100.00	25,047	100.00	113,022	100.00
STATE TOTAL:		607,959 (19.78%)		1,491,849 (48.54%)		25,047 (0.82%)		113,022 (3.68%)	

RICT	SOIL SUITABILITY	Class 4 Grazing Reserve	% of State Total	Class 5 Aborigine Reserve	% of State	Class 6 Forest Reserve	% of State Total	Class 7 Game Reserve	% of State Total	Class 8 Town Land Govt. Reserve	% of State Total	TOTAL	% of State Total
ing	Class 1	-		-		-		10,557		-		10,557	
	2	-		621		58,995		44,091		-		134,550	
	3	414		207		107,847		68,724		-		297,666	
	Total:	414	6.45	828	18.18	166,842	30.02	123,372	51.69	-	-	442,773	14.41
Tinggi	Class 1.	-		-		11,178		6,003		207		102,051	
	2.	-		2,070		18,630		32,292		-		310,500	
	3.	-		207		11,178		4,554		828		188,370	
	Total:	-		2,277	50.00	40,986	7.37	42,849	17.95	1,035	3.52	600,921	19.56
Bharu	Class 1.	-		-		6,831		-		2,070		129,582	
	2.	-		-		1,863		-		621		41,400	
	3.	-		207		2,691		-		7,038		180,711	
	Total:	-		207	4.55	11,385	2.05	-		9,729	33.10	351,693	11.44
an	1.	-		-		-		-		-		-	
	2.	-		-		-		-		-		-	
	3.	-		-		207		-		1,035		81,972	
	Total:	-		-		207	0.04	-		1,035	3.52	81,972	2.67
Pahat	1.	-		-		1,656		-		414		22,770	
	2.	-		-		-		-		-		24,840	
	3.	414		-		4,347		-		4,761		191,061	
	Total:	414	6.45	-		6,003	1.08	-		5,175	17.61	238,671	7.77
r	1.	414		-		12,213		-		2,484		125,442	
	2.	1,863		414		-		-		2,484		99,774	
	3.	414		-		29,187		-		1,035		141,174	
	Total:	2,691	41.94	414	9.09	41,400	7.45	-		6,003	20.42	366,390	11.92
uang	1.	-		-		828		3,726		621		62,100	
	2.	-		621		117,576		5,589		1,863		258,543	
	3.	621		207		60,444		5,382		207		207,414	
	Total:	621	9.68	828	18.18	178,848	32.18	14,697	6.16	2,691	9.15	528,057	17.19
amat	1.	-		-		41,607		11,799		621		121,509	
	2.	621		-		11,799		4,554		-		49,887	
	3.	1,656		-		56,718		41,400		3,105		290,835	
	Total:	2,277	35.48	-		110,124	19.81	57,753	24.20	3,726	12.68	462,231	15.04
STATE TOTAL:		6,417	100.00	4,554	100.00	555,795	100.00	238,671	100.00	29,394	100.00	3,072,708	100.00
STATE TOTAL:		6,417 (0.21%)		4,554 (0.15%)		555,795 (18.09%)		238,671 (7.77%)		29,394 (0.96%)		3,072,708 (100.00)	

TABLE 11
STATE OF JOHORE
ESTIMATED AREAS OF SOIL SUITABILITY CATEGORIES SUBJECT TO DIFFERENT ANNUAL RAINFALL INTENSITIES IN ACRES

ICT	SOIL SUITABILITY	Class 0 <70"	% of State Total	Class 1 70-80"	% of State Total	Class 2 80-90"	% of State Total	Class 3 90-100"	% of State Total	Class 4 100-110"	% of State Total	Class 5 110-120"	% of State Total	Class 6 120-130"	% of State Total	Class 7 130-140"	% of State Total	Class 8 140-150"	% of State Total	Class 9 >150"	Total	% of State Total
g	Class 1	-		-		-		-		4,140		6,417		-		-		-		-	10,557	
	2	-		-		-		14,904		4,968		60,858		52,992		828		-		-	134,550	
	3	-		-		6,831		25,254		23,184		44,091		160,218		20,286		17,802		-	297,666	
	TOTAL:	-		-		6,831	1.39	40,158	5.38	32,292	6.95	111,366	23.25	213,210	43.31	21,114	99.03	17,802	100.0	-	442,773	14.41
Tinggi	Class 1	-		-		-		-		13,041		68,310		20,700		-		-		-	102,051	
	2	-		-		-		2,484		33,741		120,060		154,215		-		-		-	310,500	
	3	-		-		-		2,070		12,006		89,284		85,284		-		-		-	188,370	
	TOTAL:	-		-		-		4,554	0.61	58,788	12.65	277,380	57.91	260,199	52.86	-		-		-	600,921	19,56
Bharu	Class 1	-		-		-		24,633		41,607		50,508		12,834		-		-		-	129,582	
	2	-		-		-		4,968		18,423		12,420		5,589		-		-		-	41,400	
	3	-		-		-		68,103		99,774		12,420		414		-		-		-	180,711	
	TOTAL:	-		-		-		97,704	13.08	159,804	34.59	75,348	15.73	18,837	3.83	-		-		-	351,693	11.44
an	Class 1	-		-		-		-		-		-		-		-		-		-	-	
	2	-		-		-		-		-		-		-		-		-		-	-	
	3	-		-		-		9,315		63,963		8,694		-		-		-		-	81,972	
	TOTAL:	-		-		-		9,315		63,963	13.76	8,694	1.82	-		-		-		-	81,972	2.67
Pahat	Class 1	-		-		2,484		4,347		15,939		-		-		-		-		-	22,770	
	2	-		-		3,105		21,735		-		-		-		-		-		-	24,840	
	3	-		-		44,919		99,774		46,368		-		-		-		-		-	191,061	
	TOTAL:	-		-		50,508	10.23	125,856	16.85	62,307	13.41	-		-		-		-		-	238,671	7.77
	Class 1	-		14,697		28,773		40,365		41,607		-		-		-		-		-	125,442	
	2	-		18,423		21,735		49,616		-		-		-		-		-		-	99,774	
	3	-		22,563		79,488		31,671		7,452		-		-		-		-		-	141,174	
	TOTAL:	-		55,683	15.59	129,996	26.34	131,652	17.62	49,059	10.56	-		-		-		-		-	366,390	11.92
g	Class 1	-		-		12,834		31,878		17,388		-		-		-		-		-	62,100	
	2	-		-		99,360		155,043		2,277		1,863		-		-		-		-	258,543	
	3	-		-		48,024		136,206		18,837		4,347		-		-		-		-	207,414	
	TOTAL:	-		-		160,218	32.47	323,127	43.25	38,502	8.28	6,210	1.29	-		-		-		-	528,057	17.19
mat	Class 1	-		59,823		61,479		-		-		-		-		-		-		-	121,509	
	2	-		42,021		7,659		207		-		-		-		207		-		-	49,887	
	3	-		199,548		76,797		14,490		-		-		-		-		-		-	290,835	
	TOTAL:	-		301,392	84.41	145,935	20.57	14,697	1.96	-		-		-		207	0.97	-		-	462,231	15.04
	STATE TOTAL:	-		357,075	100.00	493,488	100.00	747,063	100.00	464,715	100.00	478,998	100.00	492,246	100.00	21,321	100.00	17,802	100.00	-	3,072,708	100.00
	STATE TOTAL:	-		357,075 (11.62%)		493,488 (16.06%)		747,063 (24.31%)		464,715 (15.12%)		478,998 (15.58%)		492,246 (16.02%)		21,321 (0.69%)		17,802 (0.60%)		-	3,072,708 (100.00%)	

TABLE 12

STATE OF JOHORE

ESTIMATED AREAS OF ALIENATED AND STATE LAND COVERED BY FOREST CATEGORIES IN ACRES

		Class 0		Class 1		Class 2		Class 3		Class 4		Class 5		Class 6		Class 7		Class 8			
TRICT	FOREST PRODUCTIVITY	State Land	% of State Total	Alienated Agriculture	% of State Total	Mining Lease	% of State Total	Malay Reserve	% of State Total	Grazing Reserve	% of State Total	Aborigine Reserve	% of State Total	Forest Reserve	% of State Total	Game Reserve	% of State Total	Town Government Reserves	% of State Total	TOTAL	% of State Total
sing	Class 1.	1,449		-		-		-		-		-		20,079		21,114		-		42,642	
	2.	1,863		-		-		414		-		-		36,846		16,353		-		55,476	
	3.	49,887		1,656		2,484		4,347		-		828		72,864		50,922		-		182,988	
	TOTAL:	53,199	32.36	1,656	7.55	2,484	30.00	4,761	20.72	-		828	66.67	129,789	18.94	88,309	37.96	-		281.106	24.55
ta nggi	Class 1.	207		-		-		-		-		-		6,003		4,554		-		10,764	
	2.	4,140		-		-		-		-		-		18,423		17,802		-		40,365	
	3.	56,304		1,863		828		10,557		-		-		42,228		38,709		-		150,489	
	TOTAL:	60,651	36.90	1,863	8.49	828	10.00	10,557	49.95	-		-		66,654	9.73	61,065	26.22	-		201,618	17.61
hore aru	Class 1.	-		-		-		-		-		-		414		-		207		621	
	2.	1,035		1,449		-		-		-		-		21,114		-		5,175		28,773	
	3.	-		207		-		-		-		-		2,898		-		207		3,312	
	TOTAL:	1,035	0.63	1,656	7.55	-		-		-		-		24,426	3.56	-		5,589	72.97	32,706	2.86
ntian	Class 1.	-		-		-		-		-		-		-		-		-		-	
	2.	4,761		4,554		-		-		-		-		24,633		-		-		33,948	
	3.	-		-		-		-		-		-		-		-		-		-	
	TOTAL:	4,761	2.90	4,554	20.75	-		-		-		-		24,633	3.59	-		-		33,948	2.96
tu hat	Class 1.	2,070		1,242		-		-		207		-		7,659		-		-		11,178	
	2.	2,277		1,863		207		-		-		-		6,210		-		-		10,557	
	3.	2,484		2,484		-		-		-		-		414		-		-		5,382	
	TOTAL:	6,831	4.05	5,589	25.47	207	2.50	-		207	100.00	-		14,283	2.08	-		-		27,117	
uar	Class 1.	-		-		-		-		-		-		20,286		-		-		20,286	
	2.	414		414		-		-		-		-		48,024		-		1,449		50,301	
	3.	3,726		-		-		-		-		-		7,659		-		-		11,385	
	TOTAL	4,140	2.51	414	1.89	-		-		-		-		75,969	11.09	-		1,449	18.92	81.972	7.16
luang	Class 1.	828		-		-		-		-		-		20,286		19,872		-		40,986	
	2.	10,971		207		-		3,726		-		-		98,946		7,452		-		121,302	
	3.	21,321		-		-		2,898		-		-		32,499		4,761		-		61,479	
	TOTAL:	33,120	20.15	207	0.94	-		6,624	28.83	-		-		151,731	22.14	32,058	13.77	-		223,767	19.54
egamat	Class 1.	207		207		-		-		-		-		60,030		29,808		-		90,252	
	2.	207		2,691		4,347		621		-		414		103,086		21,114		207		132,687	
	3.	414		3,105		414		414		-		-		34,776		414		414		39,951	
	TOTAL:	828	0.50	6,003	27.36	4,767	57.50	1,035	4.50	-		414	33.33	197,892	28.87	51,336	22.05	621	8.11	262,690	22.95
	STATE TOTAL:	164,565	100.00	21,942	100.00	8,280	100.00	22,977	100.00	207	100.00	1,242	100.00	685,377	100.00	232,875	100.00	7,659	100.00	1,145,124	100.00
	STATE TOTAL:	164,565 (14.31%)		21,942 (1.92%)		8,280 (0.72%)		22,977 (2.01%)		207 (0.02%)		1,242 (0.11%)		685,377 (59.85%)		232,875 (20.33%)		7,659 (0.67%)		1,145,124 (100.00%)	

TABLE 13

STATE OF JOHORE

ESTIMATED AREAS OF ALIENATED AND STATE LAND COVERED BY MINERAL POTENTIALITY CATEGORIES IN ACRES

			Class 0		Class 1		Class 2		Class 3		Class 4		Class 5		Class 6		Class 7		Class 8			
RICT	MINERAL POTENTIALITY		State Land	% Of State Total	Alienated Agriculture	% Of State Total	Mining Lease	% Of State Total	Malay Reserve	% Of State Total	Grazing Reserve	% Of State Total	Aborigine Reserve	% Of State Total	Forest Reserve	% Of State Total	Game Reserve	% Of State Total	Town Government Reserve	% Of State Total	TOTAL	% Of State Total
sing	Class	1.	2,277		-		3,726		-		-		-		207		-		-		6,210	
		2.	5,003		1,449		2,070		-		-		-		1,242		-		-		10,764	
		3.	78,453		5,589		3,519		-		-		207		128,133		104,535		-		320,436	
		4.	87,561		33,948		621		21,321		621		3,105		137,241		78,246		621		363,285	
		TOTAL:	174,294	18.26	40,986	2.02	9,936	27.43	21,321	10.89	621	6.12	3,312	38.10	266,823	25.68	182,781	50.11	621	1.12	700,695	14.93
a Tinggi	Class	1.	3,933		1,449		13,041		414		-		-		414		-		-		19,251	
		2.	7,038		3,312		1,656		207		-		-		1,863		414		-		14,490	
		3.	186,714		21,321		1,242		28,359		-		-		69,759		70,173		414		377,982	
		4.	207,207		153,180		1,242		28,566		414		2,691		40,986		1,449		1,863		437,598	
		TOTAL:	404,892	42.40	179,262	8.84	17,181	47.43	57,546	29.39	414	4.09	2,691	30.95	113,022	10.88	72,036	19.75	2,277	4.10	849,321	18.10
hore Bharu	Class	1.	-		-		-		-		-		-		-		-		-		-	
		2.	-		207		-		-		-		-		-		-		-		207	
		3.	207		37,260		-		-		-		-		1,656		-		-		39,123	
		4.	36,018		295,803		-		1,449		-		207		32,085		-		21,321		386,883	
		TOTAL:	36,225	3.79	333,270	16.44	-		1,449	0.74	-		207		33,741	3.25	-		21,321	38.43	426,213	9.08
ntian	Class	1.	-		-		-		-		-		-		-		-		-		-	
		2.	-		-		-		-		-		-		-		-		-		-	
		3.	-		-		-		-		-		-		-		-		-		-	
		4.	25,461		167,877		-		6,831		-		-		25,461		-		1,449		227,079	
		TOTAL:	25,461	2.67	167,877	8.28	-		6,831	3.49	-		-		25,461	2.45	-		1,449	2.61	227,079	4.84
tu Pahat	Class	1.	-		621		414		-		-		-		-		-		-		1,035	
		2.	414		-		-		-		-		-		207		-		-		621	
		3.	28,359		26,082		-		-		207		-		9,315		-		3,933		67,896	
		4.	55,476		344,241		-		5,175		414		-		8,280		-		4,347		417,933	
		TOTAL:	84,249	8.82	370,944	18.30	414	1.14	5,175	2.64	621	6.12	-		17,802	1.71	-		8,280	14.93	487,485	10.39
uar	Class	1.	828		828		1,242		414		-		-		1,656		-		-		4,968	
		2.	207		3,312		-		-		-		-		-		-		-		3,519	
		3.	26,703		126,891		207		19,665		2,070		414		95,013		-		4,761		275,724	
		4.	14,283		257,301		-		10,971		2,277		-		9,729		-		6,417		300,978	
		TOTAL:	42,021	4.40	388,332	19.15	1,449	4.00	31,050	15.86	4,347	42.86	414	4.76	106,398	10.24	-		11,178	20.15	585,189	12.47
Kluang	Class	1.	-		414		414		-		-		-		-		-		-		828	
		2.	-		-		-		-		-		-		-		-		-		-	
		3.	23,391		121,095		-		-		-		621		183,402		39,123		414		368,046	
		4.	128,340		157,113		414		14,283		621		1,035		31,671		828		5,382		339,687	
		TOTAL:	151,731	15.89	278,622	13.74	828	2.29	14,283	7.29	621	6.12	1,656	19.05	215,073	20.70	39,951	10.95	5,796	10.45	708.561	15.10
Segamat	Class	1.	-		-		207		-		-		-		-		-		-		207	
		2.	-		-		-		-		-		-		-		-		-		-	
		3.	17,181		115,920		6,210		42,435		1,449		414		252,540		69,966		621		506,736	
		4.	18,837		152,352		-		15,732		2,070		-		8,280		-		3,933		201,204	
		TOTAL:	36,018	3.77	268,272	13.23	6,417	17.71	58,167	29.70	3,519	34.69	414	4.76	260,820	25.09	69,966	19.19	4,554	8.21	708,147	15.09
	STATE TOTAL:		954,891	100.00	2,027,565	100.00	36,225	100.00	195,822	100.00	10,143	100.00	8,694	100.00	1,039,140	100.00	364,734	100.00	55,476	100.00	4,692,690	100.00
	STATE TOTAL:		954,891 (20.35%)		2,027,565 (43.21%)		36,225 (0.77%)		195,822 (4.17%)		10,143 (0.22%)		8,694 (0.19%)		1,039,140 (22.14%)		364,734 (7.77%)		55,476 (1.18%)		4,692,690 (100.00%)	